

**IN THE UNITED STATES DISTRICT COURT
FOR THE SOUTHERN DISTRICT OF OHIO
WESTERN DIVISION**

UNITED STATES OF AMERICA,	:	Case No. 1:18-cr-00043
	:	
Plaintiff,	:	Judge Timothy S. Black
	:	
vs.	:	
	:	DEFENDANT’S REPLY TO THE
YANJUN XU,	:	GOVERNMENT’S
	:	MEMORANDUM REGARDING
Defendant.	:	THE CALCULATION OF LOSS
	:	
	:	
	:	
	:	

INTRODUCTION

On August 23, 2022, this Court conducted an evidentiary hearing on the amount of intended loss, if any, Mr. Xu should be assessed under the guidelines (USSG § 2B1.1(b)(1)). The hearing followed several submissions made by the parties to the Department of Probation, in which the government argued that the loss should be \$107 million¹ based on an estimate of the cost of research and development of the fan module of a General Electric Aviation (“GE Aviation”) jet engine, and the defense argued that the loss should be zero because the government’s proposed measure of loss was not appropriate under the circumstances. The defense suggested that if there were to be a proper way to measure intended loss, it would be a determination of future market share loss, but that such an assessment was impossible under the circumstances because of the number of unknown variables involved. At the August 23 hearing, the government maintained its position that the cost of research and development of the fan module of a jet engine was the proper measure of loss.

¹ As noted, this figure is actually \$98 million.

In a post-hearing memorandum of law filed on September 20, 2022, the defense argued that the government had failed to prove loss and pointed out that the government's own witness, GE Aviation engineer Nick Kray, had disavowed the government's theory of loss by conceding that the cost of research and development did not constitute a loss for GE. Instead, Mr. Kray testified that any theoretical loss to GE Aviation would be far in the future and would come in the form of a reduction in competitive advantage. The defense further argued through the testimony of its own expert, Dr. Barry Davidson, that even if the government's research and development matrix was used, any potential amount of intended loss could be no more than a mere fraction of the government's proposed \$98 million figure.

On October 4, 2022, the government filed its own post-hearing memorandum. It made several legally unavailing arguments in response, and, for the first time, offered as an alternative measure of loss the future market share reduction GE Aviation might have suffered if Mr. Xu's alleged trade secret theft had been successful. For the reasons set forth below, the Court should reject the government's futile and belated efforts to try to establish a loss in this case, and determine that the government has failed to meet its burden by a preponderance of the evidence to prove the special offense characteristic of loss.

ARGUMENT

I. The Government's Memorandum Presents General Sentencing Arguments that are Irrelevant for Purposes of Determining Loss

The government spent the first seven pages of its memorandum essentially relitigating the trial, explaining in great detail its view of the "scope of the offense conduct," the "value of the GE technology," and evidence presented at trial of the "greater harm intended." In so doing, the government devoted pages to China's broader efforts to steal American technology, citing to, for example, testimony by Assistant Attorney General John Demers in 2018 before Congress about China's economic espionage goals. These broad arguments about China and

even about alleged non-GE Aviation offenses that Mr. Xu allegedly committed as part of his employment for China's Intelligence Service, MSS, may be appropriate at sentencing where the government will seek to make Mr. Xu the poster child of China's aggressive economic strategies. They have no place here, however, where the Court's sole responsibility is to decide whether the government has established a specific intended loss amount.

The process is clear and unremarkable: the government provided a loss amount to the Probation Department, the Probation Department adopted that loss calculation, the defense objected, and as a result, the burden fell on the government to prove the loss amount by a preponderance of the evidence. The broad scope of Mr. Xu's alleged misconduct and China's ten-year plan to acquire Western technology are simply irrelevant to the Court's decision at this juncture. Indeed, the government appears to concede this point, allowing that "there is no way to quantify the actual losses by [Mr. Xu's] conduct" and arguing, therefore, that the Court should "place minimal weight on the sentencing guideline range in determining the sentence." Govt. Mem. at 3.

Then why did the government devote seven pages to these arguments? It seems that the government recognized how difficult it is to establish a reasonable amount of intended loss in this case, and therefore tried hard to steer the Court away from determining whether there is sufficient evidence of intended loss and toward a more generalized harm it should consider at sentencing. The Court should reject that effort. Sentencing in this case will occur in November, and both sides will submit sentencing memoranda in which all relevant arguments can be presented. The guidelines are only one factor of consideration at sentencing, and the Court has the power to fashion any sentence within the statutory range as long as it is reasonable and not greater than necessary to achieve the goals of sentencing set forth at 18 U.S.C. § 3553(a). The Court should not, however, accept the government's general sentencing

arguments as a proxy for the proof that is required to establish a reasonable estimate of loss under USSG § 2B1.1.

II. The Government’s Argument that Intended Loss Cannot Be Zero in Trade Secret Cases is Incorrect

Despite the fact that at least two circuit courts have held that the guidelines do not require a finding of loss of greater than zero, including in a trade secret case (*United States v. Yihao Pu*, 814 F.3d 818, 828 (7th Cir. 2016), the government argued that a determination of zero loss in a trade secret case is both illogical and prohibited by *United States v. Howley*, 707 F.3d 575, 582 (6th Cir. 2013). *See* Govt. Mem. at 9-10. The government is wrong on both fronts. First, no one suggests that true trade secrets do not have an inherent value – and indeed they are defined as having value by statute. *See* 18 U.S.C. § 1839(3)(b). Nor does anyone argue that someone who tries to steal a trade secret is not seeking to obtain something of value. However, determining “loss” under § 2B1.1 requires something specific – evidence based on facts and reason that allows a Court to select a loss number. The government seems to suggest that because a trade secret has a value, it does not matter whether or not the Court can reasonably estimate that value – picking a number, any number, is sufficient. But, the law is not and cannot be that where it is impossible to determine a reasonable loss amount, the Court is permitted to pull a number out of thin air.

Second, the government is incorrect when it suggests that *Howley* stands for the rule that there can be no zero loss findings in trade secret cases. In *Howley*, the government offered three different methods to measure loss. The district court rejected all three and then, “[w]ithout further explanation, the court found that the government had failed to establish any loss at all, notwithstanding beyond-a-reasonable-doubt convictions premised on the reasonable assumption that the Goodyear design—the underlying trade secret—was worth something.” *Howley*, 707 F.3d at 582. The *Howley* Court took issue with the fact that the district court had

failed to explain its reasoning for its decision to reject the government’s loss proposals: “The amount of loss was a contested and high-stakes factual question, *making it imperative that the district court engage in a more thorough explication of its calculation. Without more*, the district court’s zero-loss finding seems at odds with the defendants’ convictions for stealing property that had independent economic value.” *Id.* (internal citations and quotation marks omitted) (emphasis added). Nowhere in its decision does *Howley* state, or even imply, that a district court *must* reach non-zero amount of loss estimates in trade secret cases even if the government has failed to present sufficient evidence to allow such a reasonable estimate to be made *and* the court has adequately explained its decision.

In the nearly ten years since *Howley* was decided, the Sixth Circuit has never stated that zero loss is not possible in trade secret cases. No court in the Sixth Circuit, or anywhere else in the country, has ever reached such a blanket conclusion, or cited to *Howley* for that proposition, with the exception of *United States v. You*, No. 2:19-CR-14, 2022 WL 1397771, at *3 (E.D. Tenn. May 3, 2022) (“While the Sixth Circuit [in *Howley*] has not directed this Court to apply any particular methodology to calculate an amount of intended loss, one thing is clear: the Court must reach a non-zero determination on the amount.”). With all due respect to the *You* court, its takeaway from *Howley* is simply incorrect – as a close reading of *Howley* makes clear.

Loss is a specific offense characteristic under the guidelines. As the only other circuits to address this question have concluded, because loss is a specific offense characteristic, “the Guidelines do not require a finding of loss greater than zero under § 2B1.1.” *United States v. Yihao Pu*, 814 F.3d 818, 828 (7th Cir. 2016). *United States v. Free*, 839 F.3d 308, 323 (3d Cir. 2016) (same). There is no special exception for trade secret cases because loss under the guidelines can only be properly assessed if it is possible to reach a reasonable estimate. The fact that trade secrets may have inherent economic value does not relieve a court of the obligation

to determine whether the government established a reasonable estimate of loss based on facts. If such an estimate cannot be made, the loss must be zero. A zero loss does not mean the Court cannot account for the inherent value of trade secrets in other ways. As *Howley* itself pointed out, the ultimate guideline calculation will “not override the district court’s duty to exercise discretion in deciding what sentences to impose on the defendants, whether within the guidelines range or outside of it.” *Howley*, 707 F.3d at 583. In other words, while the law does not permit the Court to pick a random number without factual support just because a zero loss finding yields a sentence recommendation that is too low, the Court has multiple tools available to fashion an appropriate sentence, regardless of the guideline range.

III. Development Costs Are an Inappropriate Measure of Loss in this Case

In its memorandum, the government proclaimed that the development costs incurred by GE Aviation in the research and design of the fan module of a jet engine (as reflected in Exhibit A) are “narrowly tailored,” as if to suggest that the defense should be happy because it could have been worse. *See* Govt. Mem. at 11. The burden is on the government to establish loss. The government arrived at \$98 million in development costs and consistently adhered to that figure. It is, frankly, irrelevant and inappropriate to suggest that because the loss might have been configured higher, the Court and the defense should accept the \$98 million figure without complaint. *If* the government had evidence to advance a higher loss figure, it had plenty of opportunity to do so. Since it has not established a higher number, any veiled and conclusory arguments about potential higher costs and losses are simply beside the point.

Moreover, the government’s arguments attempting to demonstrate why the loss figure is “narrowly tailored” make little sense. For example, the government stated that the estimate “does not include all of the engineering or development costs associated with developing an engine,” but is limited to engineering of the fan module. *See id.* at 12. But of course any

intended loss *should* be limited at most to the fan module. As was thoroughly explained at the hearing, the fan module is only one section of several that make up a jet engine. Mr. Xu was convicted of attempting to obtain trade secrets about composite components contained in the fan module. There is no evidence in the record that he attempted to seek information about other parts of the engine, including the extremely highly-engineered part known as the “hot section.” *See e.g.* Hearing Transcript at PAGEID 5102. It would be improper to assign costs associated with other parts of the engine (outside of the fan module) as losses that Mr. Xu intended to cause.

The government also made the odd argument that the loss estimate is conservative because it assumes the success of the process. *See* Govt. Mem. at 13. If, under the government’s theory, GE Aviation’s costs “measure the estimated savings that accrue to the thief,” then those savings obviously only occur (and are thus only intended) if GE Aviation’s engineering is successful. Similarly, the government criticized the defense argument that full certification testing of the engine has to be done by China regardless and therefore does not spare China from those costs – because such an argument assumes the certification test is successful. *See id.* at 13, n.1. This argument also makes no sense. The defense asserted that because China would have to bear the cost of a successful full rig certification test whether or not trade secrets were obtained, that \$50 million test could not be included in the intended loss amount. Obviously, if the test is not successful and has to be redone, China would bear even greater costs, but it is illogical to suggest that Mr. Xu’s intent was to cause GE Aviation losses related to failures of testing.²

² To the extent the government is arguing that the acquisition of GE Aviation’s trade secrets would have helped China avoid failure in its certification test (and therefore saved China money), that assertion is completely speculative. Moreover, as the government expert testified, nobody wants a surprise failure when it comes to the certification test because it is so expensive, so all necessary testing will have been done in advance of the certification test to ensure success. *See* Hearing Transcript at PAGEID 5015.

Ultimately, the government does not seriously contest the defense argument that development costs in this case are not an appropriate measure of loss. The one page it devoted to attempting to refute that argument (*see id.* at 14) simply regurgitated the undisputed fact that the guidelines commentary suggests that cost of research and development may, where “appropriate and practicable under the circumstances,” be used to determine loss in trade theft cases. As is fully discussed in the defense opening brief, however, the circumstances here simply do not lend themselves to using the costs of research and development as a proxy for intended loss. The government further sought to distinguish the 7th Circuit’s decision in *Pu*, which was largely cited for its holding that loss higher than zero is not required in trade theft cases, but the government offered no rationale to refute the common sense argument (and concession by Nick Kray) that the loss GE Aviation might have suffered if the theft had been successful was not related to its research and development costs.

IV. Even If Development Costs Were an Appropriate Measure of Loss, the Intended Loss to GE Aviation Could only be a Fraction of the Government’s \$98 Million Figure

Addressing the defense’s alternative argument that even if the costs cited in Exhibit A were the correct measure of loss, the \$98 million figure is vastly inflated – the government did little to counter the concrete points made in the defense brief at pp. 15-22. Instead, the government offered generalities and critiques of the defense expert, Dr. Davidson, and set up a red herring that should be ignored.

As one of the world’s foremost experts in composite technology, Dr. Davidson offered opinions about the process involved in creating fan blade and encasement systems made from composite materials. Rather than address the concrete expert opinions offered by him, the government simply tried to write him off as merely a professor at Syracuse University for 31 years, omitting the fact Dr. Davidson is currently employed as a consultant for NASA and has

frequently consulted with most if not all of the major aerospace companies in the United States, including GE Aviation and Boeing. *See* Hearing Transcript at PAGEID 5051-52. Indeed, it seems silly to suggest, after hearing his testimony, that Dr. Davidson was somehow unknowledgeable or ill-informed about the topics at issue.

In addition to discussing the highly complex process of composite technology in jet engine fan blades and encasements, Dr. Davidson also offered an expert opinion on where China stood in 2017 in its own development of composite fan blades and encasements. He based that opinion on an extensive review of the scientific literature that reports on China's progress.³ Rather than seek to contest Dr. Davidson's opinions through its own evidence or examination, the government merely tried to diminish his credibility by asserting that he is not an expert on Chinese technology and has "no firsthand knowledge" of China's development. Govt. Mem. at 15. Both are true, of course, but irrelevant. Dr. Davidson conveyed to the Court what the academic literature has to say about the state of Chinese development in this area as of 2017. If the government believed that the scientific literature or his conclusions derived from that literature were false, it could have tried to refute them. Since it did not, there is no reason or basis not to credit Dr. Davidson's opinions.

Furthermore, rather than engage the defense arguments and Dr. Davidson's opinions about the building block method used to design carbon composite component parts, the significant differences in outcomes if the material selection process was different, and the impact of differing manufacturing methods on test results, the government chose to ignore them and argue instead that "defendant's futility arguments are irrelevant and illogical." This is yet another red herring. The government argued that the state of China's technology and the

³ Notably, the literature reviewed by Dr. Davidson was not propaganda pushed out by the Chinese government; it consisted of peer-reviewed articles that met the requirements of academic journals. *See* Hearing Transcript PAGEID 5053, 5094.

potentially limited usefulness of GE Aviation's trade secrets for China's development process are irrelevant because the intent was to acquire these secrets and whether those secrets would in the end be helpful is not part of the equation. That argument is simply incorrect.

The Court is tasked with determining the loss that Mr. Xu intended to cause, which in this matrix, is the advantage or time savings China sought to obtain. It is obvious that this intent is informed by what China needed and what benefit, if any, it would likely obtain from the information. If, for example, China had progressed along the development process of composite materials into the phase of subcomponent testing, then any information related to earlier parts of the process would presumably be unnecessary and would therefore not constitute part of any intended loss. It is similarly relevant that both experts agreed that even if China had obtained the sought-after trade secrets, it would still have had to engage in much of the same testing and certification efforts as GE Aviation to bring an engine incorporating composite materials to market. If China had to conduct expensive testing whether or not it had built its product through trade theft, then the costs of that testing cannot be considered a loss to GE Aviation and therefore would not constitute a loss intended by Mr. Xu.

Ultimately, if there was one take-away from Dr. Davidson's testimony it was that the technology at issue is so highly engineered and complex, virtually all of the costs of research and development would have been incurred both by GE Aviation *and* by China, whether or not trade secrets had been obtained. This technology is not Coca Cola's secret formula. It is incapable of being "robbed, replicated, and replaced" as the government suggests. The government made no attempt, either at the hearing or in its post-hearing memorandum to refute, contest, or challenge that basic conclusion. Instead, the government offered unsupported speculation that China would not have devoted the resources it did to seek to acquire GE Aviation's technology if it had not considered it to be valuable. Perhaps that is

true, perhaps it is not.⁴ But even if China placed some value on this information, and some of it would have helped its development in some fashion, the government has never established how, specifically, the requested information would have assisted China along its development process, where the alleged time and cost savings would have occurred, or even which tests China could have avoided. Without that evidence, the government has not met its burden to provide the Court with a reasonable estimate of loss.

V. The Government's 12th Hour Market Share Loss Argument Must be Rejected

The government's post-hearing memorandum on loss amount is startling in a number of respects, including that it made the extraordinary request (by federal prosecutors) for the Court to essentially ignore the guidelines because they offer no assistance in this case. *See* Govt. Mem. at 1, 3. Perhaps most surprising, however, was the government's belated argument that market share loss is maybe a better measure of loss after all. The government's change of position has come too little, too late.

As part of the Presentence Investigation, both parties submitted arguments on loss to the Probation Department. In a detailed letter dated January 25, 2022, the government forcefully argued for a \$107 (\$98) million loss based on the costs of research and development. The defense argued for zero loss as previously explained. That argument included a suggestion that if there were to be any intended loss, it would have to be based on market share loss, a determination that was impossible to make in this case. When the initial PSR was disclosed, the defense again objected to the loss amount, which the Probation Department had merely adopted from the government's submission. The government stood by its loss proposal of using the costs of research and development. Because of the vast gulf between the parties on

⁴ Notably, China did virtually nothing to try to obtain information about composite fan blade technology from David Zheng until it was offered this material on a silver platter by the FBI.

the loss question, the Court conducted an evidentiary hearing at which the government bore the burden of proving loss. The government held steadfast to its loss figure of \$98 million based on costs of research and development and made no effort to introduce evidence supporting an alternative method of determining loss – even after its own expert, Nick Kray, conceded that only a reduction in future competitive advantage *might* constitute a potential loss to GE Aviation.

Now, nearly nine months after its first submission on loss, the government has shifted course entirely and proposes a loss amount of \$94 million based on potential market share loss. *See* Govt. Mem. at 17-21. In support of this new argument, the government downloaded some market research off the internet and submitted GE Aviation's 2021 annual report.

The Court set aside a day in August for the parties to make their evidentiary presentations. The government had its chance. If it had offered an expert to explain the potential future market share loss that GE Aviation might have suffered, the defense would have had the opportunity to scrutinize and refute those opinions, perhaps offering its own expert's analysis. It could have cross-examined the government's expert about the tremendous speculation involved in trying to ascertain a potential market share loss that might occur 10-30 years in the future, by which time the entire aerospace industry would likely have gone through significant changes. None of that was possible, however, because the government failed to present any such evidence. It would therefore be utterly unfair and inappropriate for the Court now to rely on the new documents the government attached to its memorandum and to adopt its market share loss theory.

Moreover, the government's numbers are flawed. For example, GE Aviation's annual report shows revenue from the sale of new commercial jet engines and service contracts. But one of the reasons future market share loss is impossible to assess in this case is that Mr. Xu's

alleged attempted trade secret theft concerned only the fan module of the engine, part of the so-called “cold” section. The fan module works in conjunction with multiple other engine systems including, for example, the “hot” section of the jet engine that itself requires a series of complex and highly engineered components made from other unique materials. As Dr. Davidson testified, China lags significantly behind the West in its development of the hot section of the engine. Until it can move forward on that part of the engine, whatever development it has achieved on the fan module will not help China shorten its timeline to get a full engine to market. *See* Hearing Transcript, at PAGEID 5102. Because Mr. Xu’s alleged trade secret theft concerned the fan module, GE Aviation’s revenue from the sale of *full* engines is not helpful in determining market share loss.⁵ And because China has not been able to engineer the hot section of the jet engine, China’s acquisition of trade secrets relating to the cold section will not hasten its engine development timeline.

The government’s internet research does not make a determination of future market share loss less speculative. Boeing’s and Airbus’s future projections are basically meaningless because none of the numbers matter until China can actually build and certify an airworthy jet engine containing composite materials and begin to replace GE Aviation engines for use on its future commercial aircraft. It is impossible to know if or when that will occur, and in the interim numerous variables will undoubtedly affect current projections.

The Court cannot make up a number. Loss, including intended loss that did not actually occur, must still be based on facts and evidence. Even in the *You* case cited by the government as an instance where the court rejected both the government’s and the defense’s loss proposals and arrived at its own calculation, the court nevertheless did so based on

⁵ Nor are revenues from service contracts relevant, since there is no evidence in the record that GE Aviation services engines in China or that a relevant loss would have occurred.

concrete evidence presented at the trial.⁶ *See You*, 2022 WL 1397771, at *3 (“In reaching a determination of intended loss, the Court will rely on other ‘available information’ established during trial, as is permitted by the Guidelines.”).

The Sixth Circuit’s reaffirmation that intended loss need not be exact and that a reasonable estimate is sufficient does not relieve the Court of its obligation to require the government to prove loss by competent evidence. That has not occurred here. The government merely offers a mish mash of sentencing arguments and generalized, unsupported propositions, and is trying to sidestep the real and concrete objections to the loss amount made by the defense at the hearing and in its submissions. For these reasons, the Court should grant the defense’s objection to the loss amount in the Presentence Report and strike the 24 point enhancement at ¶ 58 of the PSR.

Respectfully submitted,

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⁶ Notably the *You* court “agree[d] with the parties that probation’s estimation of intended loss, based on the cost of development of the trade secrets at issue, is inappropriate.” *Id.* at 3.

CERTIFICATE OF SERVICE

I hereby certify that on October 12, 2022 a copy of the foregoing was filed electronically. Notice of this filing will be sent to all parties in this case by operation of the Court's CM/ECF system. Parties may access this filing through the Court's system.

/s/ Jeanne M. Cors